APPENDIX G

FACILITY AIR LEAKAGE RATES

G-1. Facility Envelope Air Leakage Database.

The facility leakage information in Table G-1 results from field leakage testing with a calibrated blower door assembly. The graphs in Figures G-1 through G-9 show leakage characteristics for the facility construction types indicated.

G-2. Facility Envelope Construction Types.

Facility wall and roof construction is categorized into the general types below. These categories are referred to in the leakage characteristic graphs.

a. *Wall Construction Types*.

(1) Type 1: 25-mm (1-inch) stucco or siding, insulation, 20-mm (¾-inch) plaster or gypsum.

(2) Type 2: 25-mm (1- inch) stucco or siding, 200-mm (8-inch) concrete block or cast-in-place concrete, 20-mm (¾-inch) plaster or gypsum.

(3) Type 3: steel siding, insulation, steel siding.

(4) Type 4: 100-mm (4-inch) face brick, insulation, 300-mm (12-inch) concrete block or cast-in-place concrete, 20-mm (¾-inch) plaster or gypsum.

(5) Type 5: concrete thickness as indicated in millimeters (inches), insulation, 20-mm (¾-inch) plaster or gypsum. No windows.

b. *Roof Construction Types*.

(1) Type 1: slag or stone, felt membrane, insulation, steel siding.

(2) Type 2: slag or stone, felt membrane, lightweight concrete.

(3) Type 3: Concrete thickness in mm (inches), insulation.

Table G-1
Facility Air Leakage Rates

Bldg. No.	Building Function	TFA Area sq m (sq ft)	TFA Volume cu m (cu ft)	Airflow Leakage Rate @ 5 Pa (0.02 in wg) L/s (cfm)	Airflow Leakage Rate @ 75 Pa (0.3 in wg) L/s (cfm)	Area Unit Leakage Rate @ 5 Pa (0.02 in wg) $L/s/m^2$ (cfm/ft^2)	Area Unit Leakage Rate @ 75 Pa (0.3 in wg) $L/s/m^2$ (cfm/ft^2)	Volume Unit Leakage Rate @ 5 Pa (0.02 in wg) $L/s/m^3$ (cfm/ ft^3)	Volume Unit Leakage Rate @ 75 Pa (0.3 in wg) $L/s/m^3$ (cfm/ft^3)
1	C3	7,061 (76,000)	94,582 (3,340,000)	516 (1,094)	2,550 (5,421)	0.0731 (0.0144)	0.3611 (0.0713)	0.0055 (0.0003)	0.0270 (0.0016)
2	Comm. Facility	412 (4,440)	1,006 (35,520)	185 (392)	814 (1,725)	0.4490 (0.0883)	1.9757 (0.3885)	0.1839 (0.011)	0.8091 (0.0486)
3	Admin.	534 (5,750)	2,280 (80,500)	136 (288)	572 (1,212)	0.2547 (0.0501)	1.0712 (0.2108)	0.0596 (0.0036)	0.2509 (0.0151)
4	Squadron Operations	758 (8,160)	3,235 (114,240)	67 (142)	365 (773)	0.0884 (0.0174)	0.4815 (0.0947)	0.0207 (0.0012)	0.1128 (0.0068)
5	Squadron Operations	929 (10,000)	283 (100,000)	612 (1,297)	3,412 (7,234)	0.6588 (0.1297)	3.6728 (0.7234)	2.1625 (0.0130)	12.0565 (0.0723)
6	Gymnasium	740 (7,960)	7,213 (254,700)	1,491 (3,161)	4,976 (10,550)	2.0149 (0.3971)	6.7243 (1.3254)	0.2067 (0.0124)	0.6899 (0.0414)
7	Gymnasium	1,022 (11,000)	9,968 (352,000)	1,096 (2,323)	5,296 (11,228)	1.0724 (0.2112)	5.1820 (1.0207)	0.1100 (0.0066)	0.5313 (0.0319)
8	Dormitory	1,105 (11,890)	6,734 (237,800)	1,598 (3,388)	4,571 (9,691)	1.4462 (0.2849)	4.1367 (0.8151)	0.2373 (0.0142)	0.6788 (0.0408)

G-3. Building Number 1.

Building number 1 is a poured concrete structure with 3.1-m-thick walls and roof. The facility has no windows. Leakage rate versus internal pressure is shown in Figure G-1. Building leakage rates can be calculated using equation G-1.

$$\log(y) = C_0 + C_1 \log(x) \qquad \text{(eq G-1)}$$

where: C_0 = 2.3007476
C_1 = 0.59040570
y = leakage rate, L/s
x = internal pressure, Pa

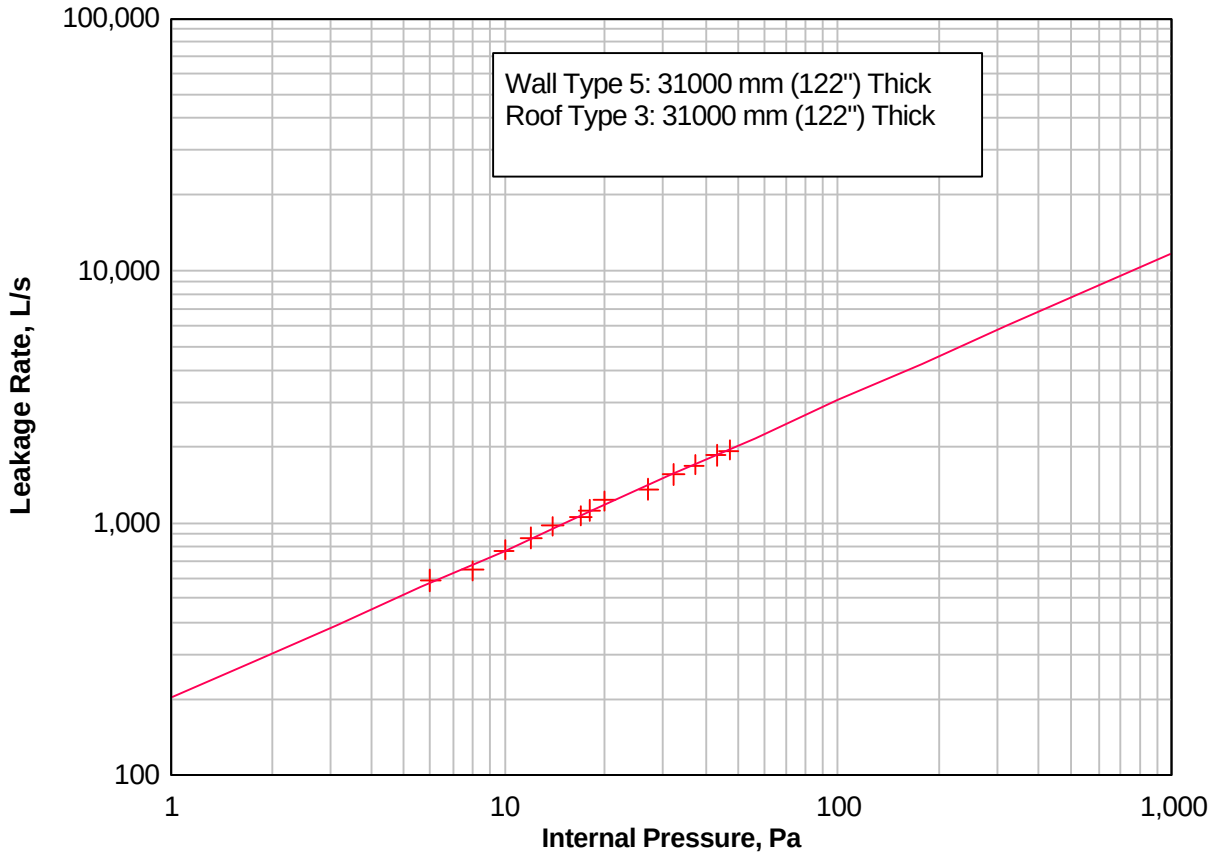

Figure G-1. Building 1 Leakage Rate.

G-4. Building Number 2.

Building number 2 is a poured concrete structure with 0.66-m-thick walls and roof. The facility has no windows. Leakage rate versus internal pressure is shown in Figure G-2. Building leakage rates can be calculated using equation G-2.

$$\log(y) = C_0 + C_1 \log(x) \qquad \text{(eq G-2)}$$

where: C_0 = 1.8871234
C_1 = 0.54579516
y = leakage rate, L/s
x = internal pressure, Pa

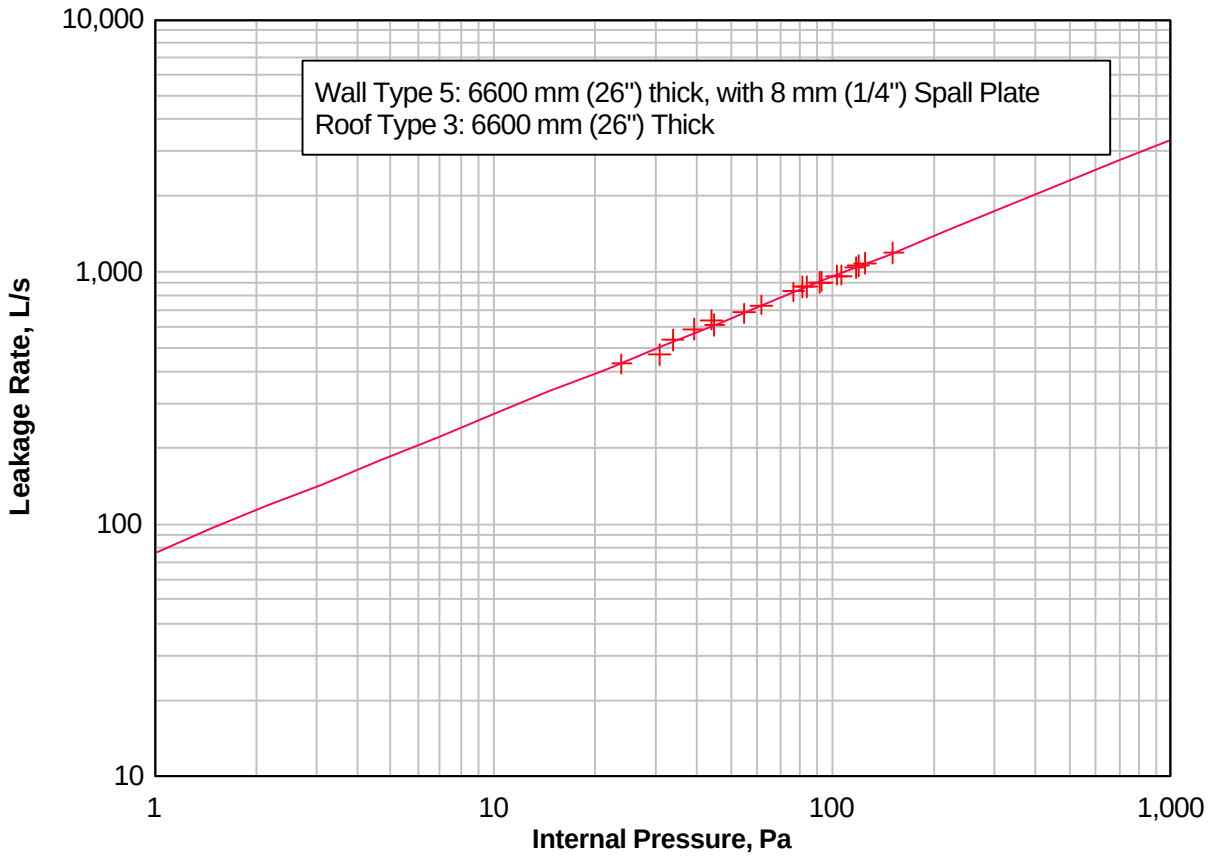

Figure G-2. Building 2 Leakage Rate.

G-5. Building Number 3.

Building number 3 is a poured concrete structure with 0.66-m-thick walls and roof. The facility has no windows. Leakage rate versus internal pressure is shown in Figure G-3. Building leakage rates can be calculated using equation G-3.

$$\log(y) = C_0 + C_1 \log(x) \qquad \text{(eq G-3)}$$

where: C_0 = 1.7654878
C_1 = 0.52904921
y = leakage rate, L/s
x = internal pressure, Pa

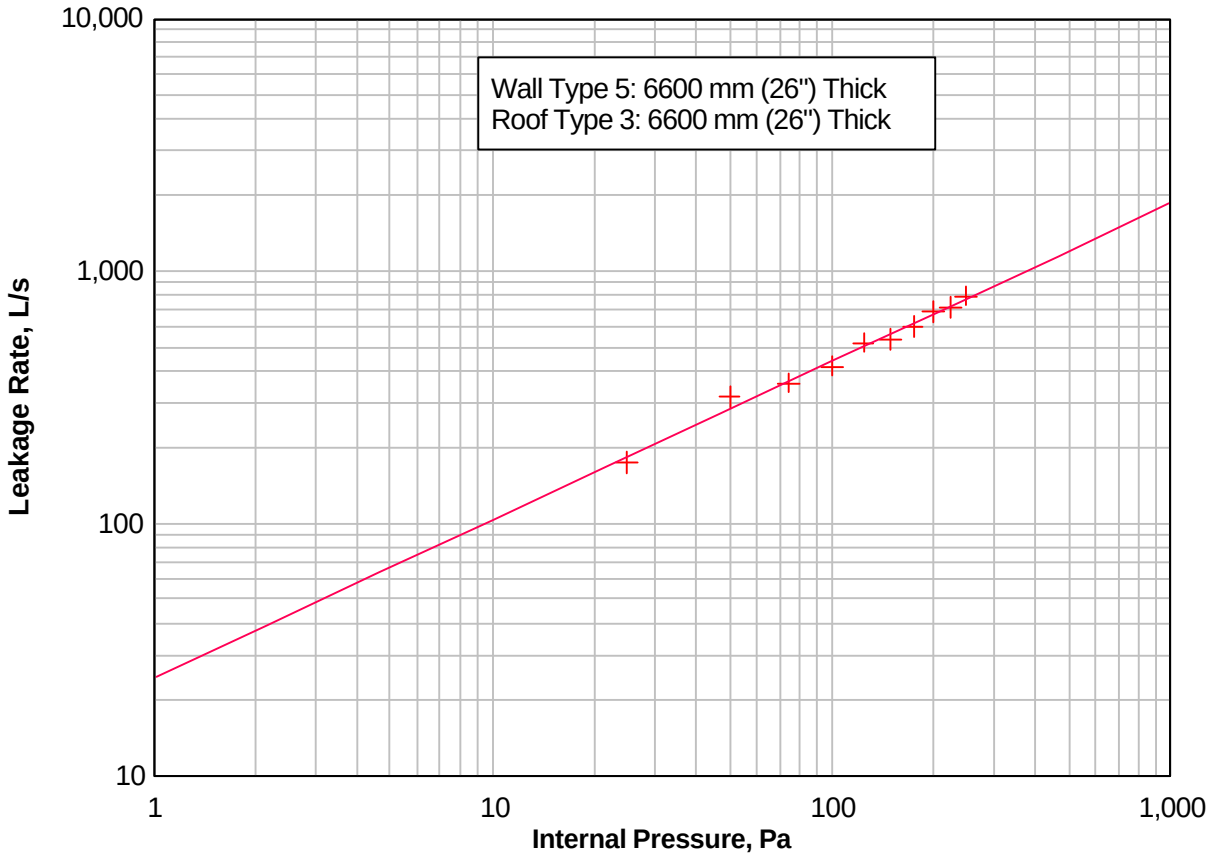

Figure G-3. Building 4 Leakage Rate.

G-6. Building Number 4.

Building number 4 is a poured concrete structure with 0.66-m-thick walls and roof. The facility has no windows. Leakage rate versus internal pressure is shown in Figure G-4. Building leakage rates can be calculated using equation G-4.

$$\log(y) = C_0 + C_1 \log(x) \qquad \text{(eq G-4)}$$

where: C_0 = 1.3882766
C_1 = 0.62650449
y = leakage rate, L/s
x = internal pressure, Pa

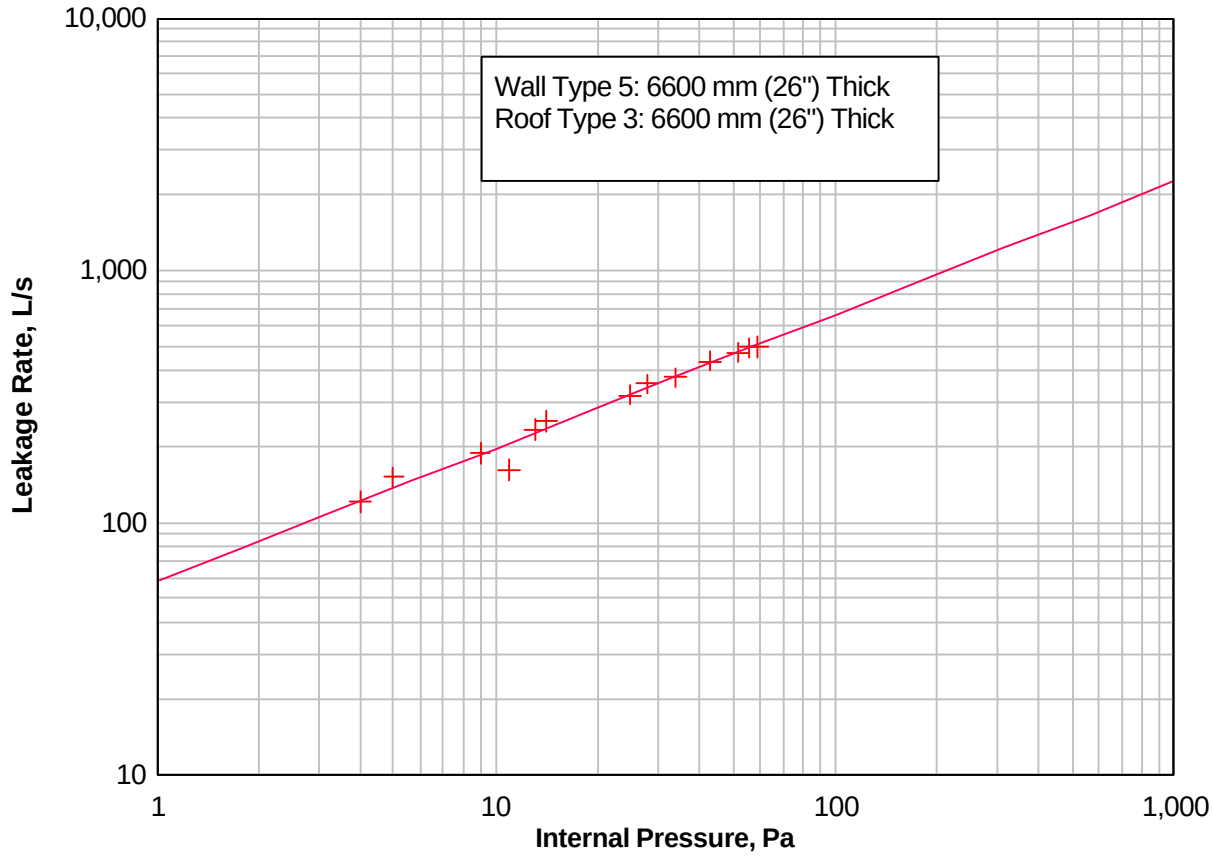

Figure G-4. Building 3 Leakage Rate.

G-7. Building Number 5.

Building number 5 is constructed of concrete block walls and cast-in-place concrete roof. The facility has 26 sliding windows and the majority are relatively tight. Leakage rate versus internal pressure is shown in Figure G-5. Building leakage rates can be calculated using equation G-5.

$$\log(y) = C_0 + C_1 \log(x) \qquad \text{(eq G-5)}$$

where: C_0 = 2.3433194
C_1 = 0.63452276
y = leakage rate, L/s
x = internal pressure, Pa

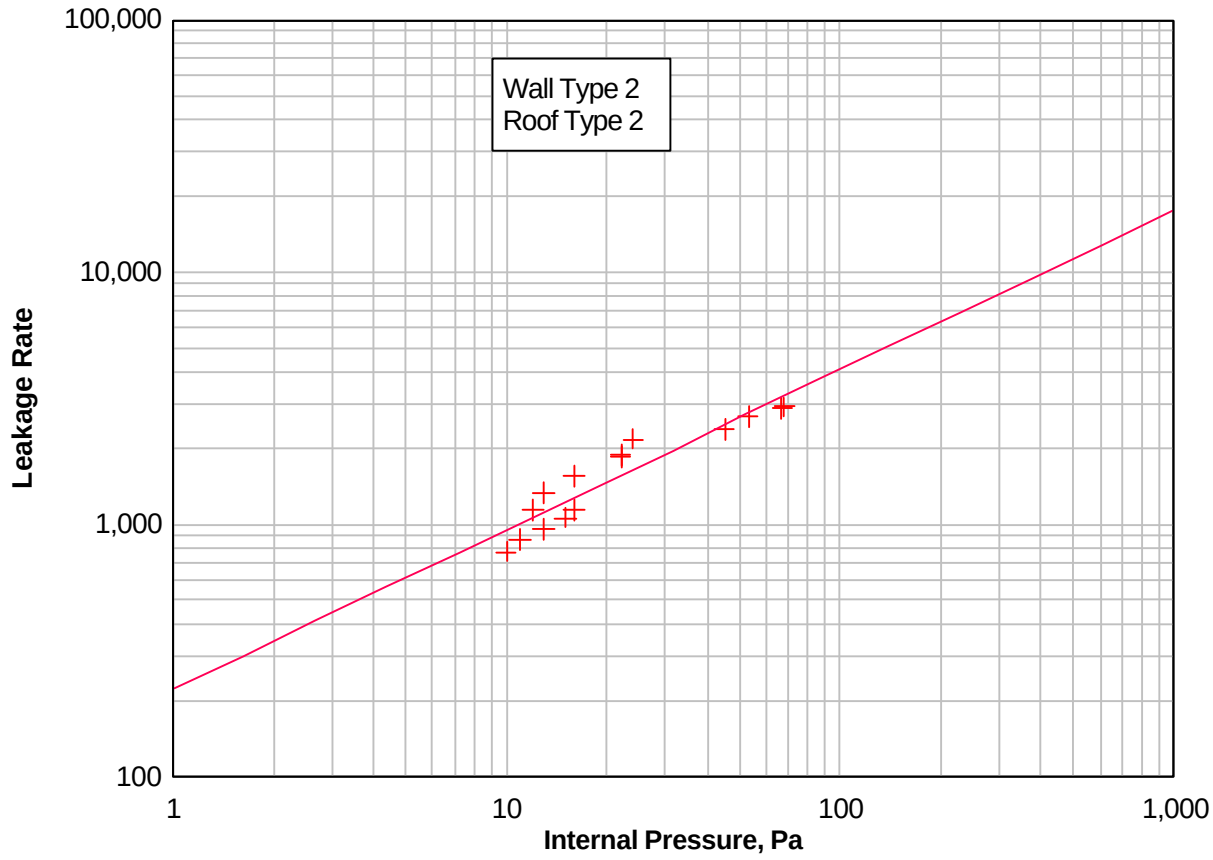

Figure G-5. Building 5 Leakage Rate.

G-8. Building Number 6.

Building number 6 has block walls with an insulated metal siding upper portion. The roof is standing seam metal. A moderate number of fiberglass windows are installed in the upper portions of the wall. Leakage rate versus internal pressure is shown in Figure G-6. Building leakage rates can be calculated using equation G-6.

$$\log(y) = C_0 + C_1 \log(x) \qquad \text{(eq G-6)}$$

where: C_0 = 2.8625607
C_1 = 0.44496218
y = leakage rate, L/s
x = internal pressure, Pa

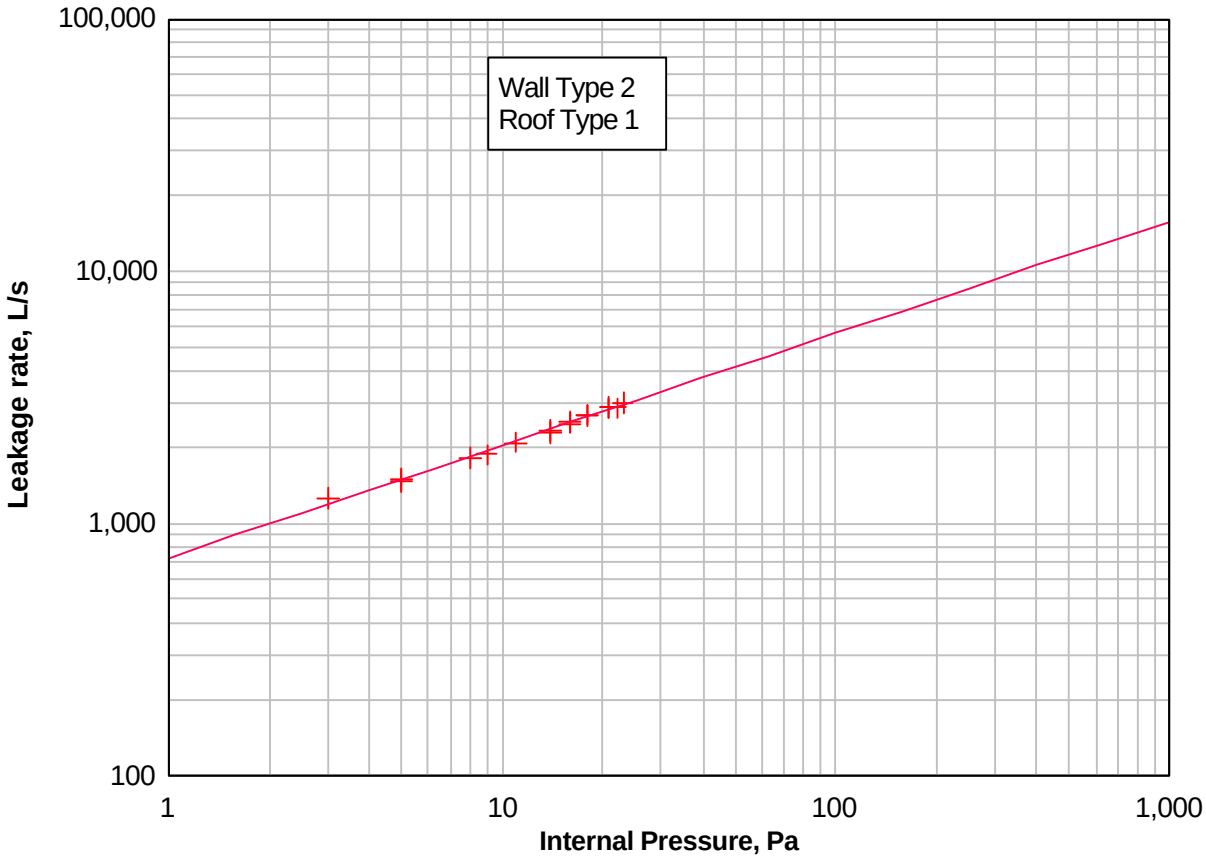

Figure G-6. Building 6 Leakage Rate.

G-9. Building Number 7.

Building number 7 has block walls with an insulated metal siding upper portion. The roof is standing seam metal. A large number of windows are installed in the upper portions of the wall. Leakage rate versus internal pressure is shown in Figure G-7. Building leakage rates can be calculated using equation G-7.

$$\log(y) = C_0 + C_1 \log(x) \qquad \text{(eq G-7)}$$

where: C_0 = 2.6334308
C_1 = 0.58162360
y = leakage rate, L/s
x = internal pressure, Pa

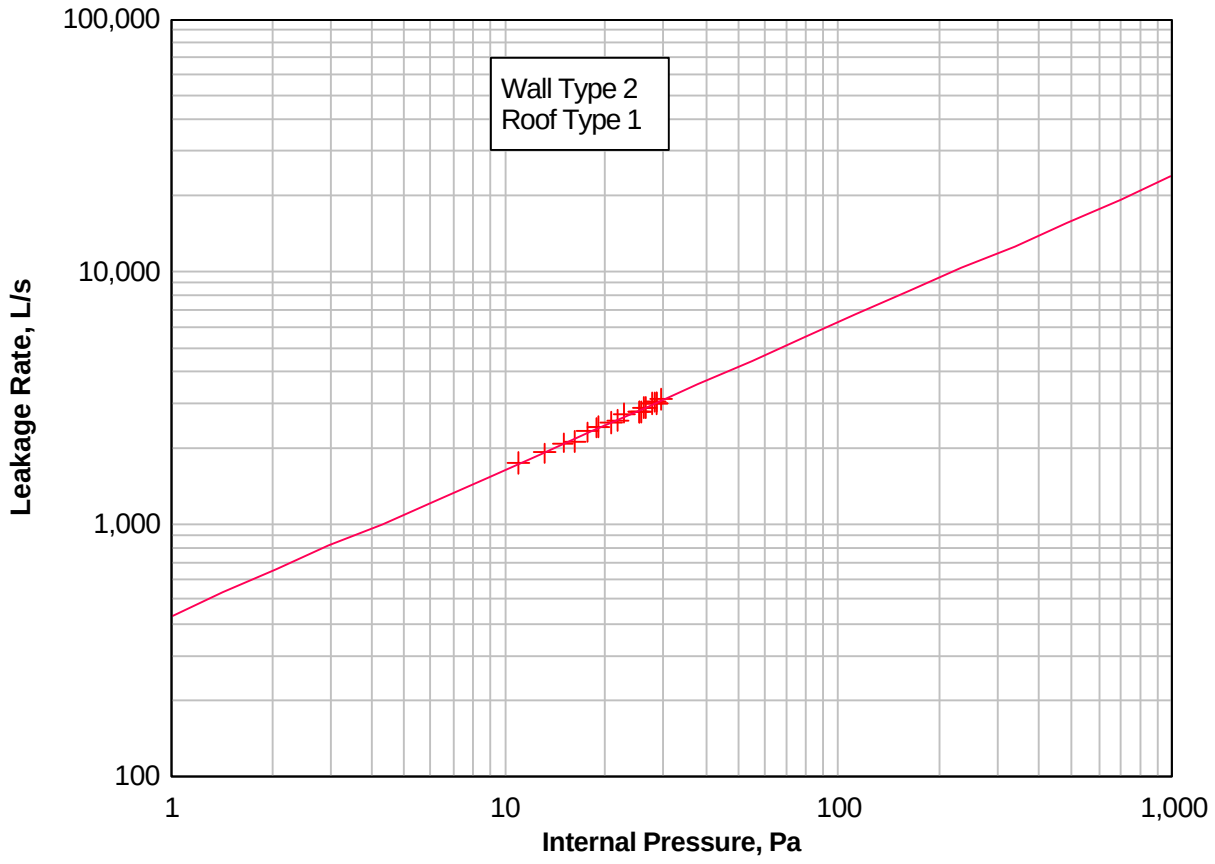

Figure G-7. Building 7 Leakage Rate.

G-10. Building Number 8.

Building number 8 is a two-story facility with block walls and a concrete roof. The facility has a moderate number of windows. Leakage rate versus internal pressure is shown in Figure G-8. Building leakage rates can be calculated using equation G-8.

$$\log(y) = C_0 + C_1 \log(x) \qquad \text{(eq G-8)}$$

where: C_0 = 2.9324394
C_1 = 0.38805886
y = leakage rate, L/s
x = internal pressure, Pa

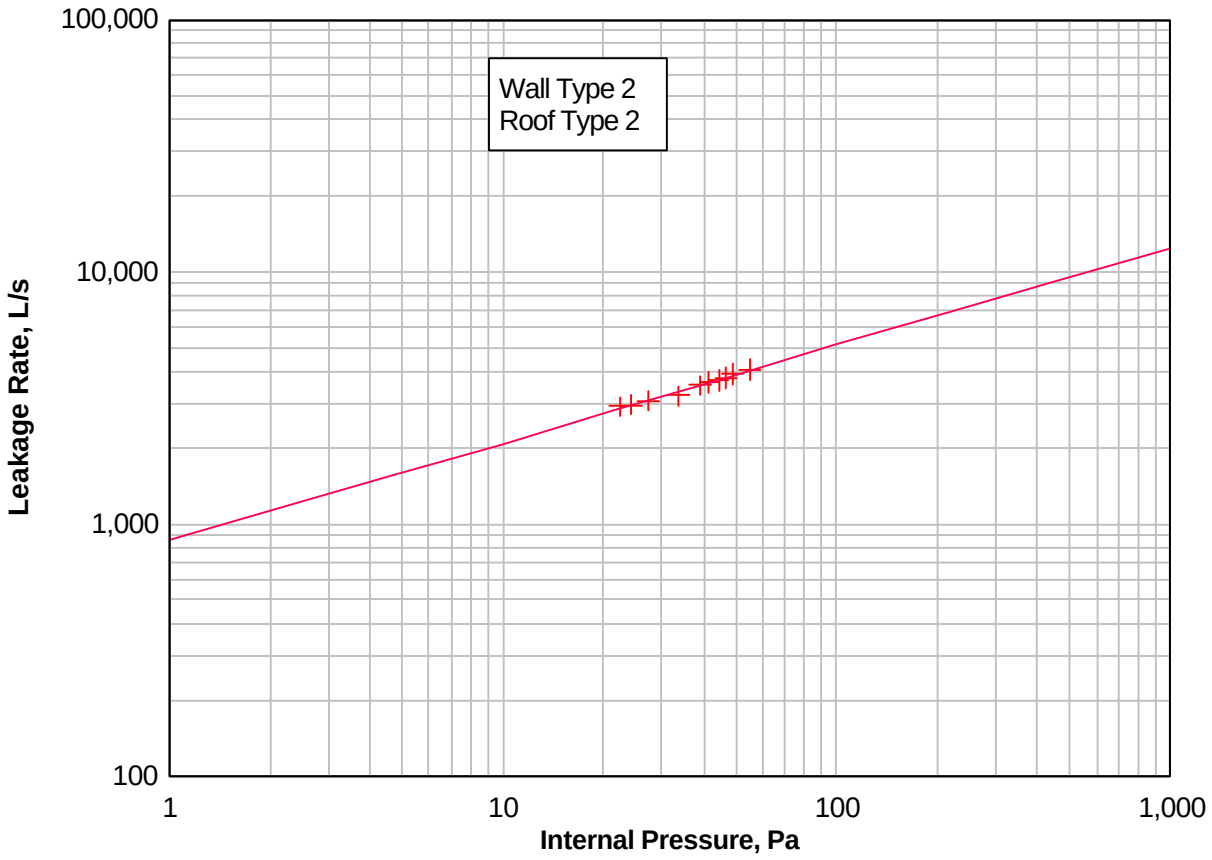

Figure G-8. Building 8 Leakage Rate.